



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/784,827

02/15/2001

Colm J. Prendergast

AD-217J

5800

7590

06/07/2004

IANDIORIO & TESKA  
260 BEAR HILL ROAD  
WALTHAM, MA 02451-1018

EXAMINER

SINGH, RAMNANDAN P

ART UNIT

PAPER NUMBER

2644

21

DATE MAILED: 06/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/784,827

**Applicant(s)**

PRENDERGAST ET AL.

**Examiner**

Ramnandan Singh

**Art Unit**

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 19-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 19-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed on 12 January 2004 have been fully considered but they are not persuasive.

(i) Applicant's argument—" In contrast to Ehlig et al, claim 1 as amended of the subject application includes a digital to analog circuit configured to provide a constant average analog output signal" [Page 7, lines 1-2].

Examiner's response—The Examiner respectfully disagreed. Fig. 10 of Ehlig et al shows a digital to analog (D/A) converter 539 having an analog output connected to the DAA. However, Ehling does not describe expressly the construction of the digital to analog (D/A) converter 539. So one of the ordinary skill in the art would have been motivated to seek any D/A circuit suitable to receive a digital input and convert that into an analog output, such as Davis et al [US 4,539,552], which inherently provides a constant average analog output signal [Davis et al: Fig. 9; col. 18, lines 53-59].

(ii) Applicant's argument—"Moreover, the Examiner has given no support whatsoever for his assertion that a constant average voltage is inherent feature of an analog communications system across an isolation barrier" on page 8.

Examiner's response—To support the above assertion, the Examiner cites a U.S. Patent [US 6,545,785 B1] to Heflinger et al , wherein Heflinger et al teach an analog

Art Unit: 2644

optical communications system (10) having an isolation barrier (9) [See Fig. 1] using a constant average voltage shown in Figs. 2-3 [col. 3, lines 5-15; col. 2, lines 27-34].

2. **Status of Claims**

Claims 1-3, 19-20 are amended.

Claims 17-18 are cancelled.

New claim 25 is added.

Claims 1-16, 19-25 are pending.

***Claim Rejections - 35 USC § 103***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 2644

4. Claims 1-7, 13-16 and 21-25 rejected under 35 U.S.C. 103(a) as being unpatentable over Ehlig et al [US 5,550,993] in view of Davis et al [US 4,539,552].

Regarding claim 1, Ehlig et al teach analog communication across an isolation barrier in the form of a data access arrangement (DAA) 787 shown in Fig. 10, wherein this DAA may comprise a single isolation element or a mixture of multiple isolating elements in parallel such as capacitors, transformers, and optical isolators. The analog communication system comprises a digital to analog (D/A) converter 539 having an analog output  $S(t)$  connected to the DAA; an analog to digital (A/D) converter 785 having an input coupled to the analog output of the DAA for providing a digital output [Figs. 10-12, 18; col. 31, lines 14-56; col. 34, lines 15-34]. However, Ehling et al do not describe the construction of the digital to analog (D/A) converter 539. So one of the ordinary skill in the art would have been motivated to seek any D/A circuit suitable to receive a digital input and convert the digital input into an analog output, such as the D/A circuit of Davis et al [US 4,539,552], which also provides a constant average analog output signal [Davis et al: Fig. 9; col. 18, lines 53-59]. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the digital to analog circuit of Davis et al for the digital to analog (D/A) converter 539 of Ehlig et al [Davis et al; col. 2, lines 20-26; col. 1, lines 60-63].

Claim 21 is essentially similar to claim 1 except a bi-directional isolation system.

Ehling et al teach a bi-directional isolation system 787 shown in Fig. 18.

Regarding claim 2, Fig. 10 of Ehlig et al shows a digital to analog (A/D) converter 539 of Ehling et al to provide a constant average analog output signal [Davis et al: Fig. 9; col. 18, lines 53-59] to the isolation barrier.

Regarding claim 3, Ehling et al teach a digital modulator 533 connected to the D/A 539 [Fig. 10] wherein the D/A provides a constant average analog output signal [Davis et al: Fig. 9; col. 18, lines 53-59] to the isolation barrier.

Regarding claim 4, Ehling et al teach an analog to digital (A/D) converter 521 [Fig. 11].

Regarding claim 5, Ehling et al teach an analog communication system that includes a D/A converter 539 and an A/D converter 521 [Figs. 10-12, 18].

Claim 6 is essentially similar to claim 2 and is rejected for the reasons stated above.

Claim 7 is essentially similar to claim 4 and is rejected for the reasons stated above.

Art Unit: 2644

Regarding claims 13-16, Ehlig et al teach data and control information [Fig. 16] supplied by two-way communication paths DSP 653 and a second device 11 [col. 32, lines 66-67; col. 33, lines 1-16].

Regarding claims 22-23, Ehlig et al teach analog communication with a bi-directional isolation system 787 [Fig. 18].

Regarding claim 24, Ehlig et al teach an echo canceller 515 to improve the transmission of a communication circuit [Fig. 9; col. 27, lines 54-62; col. 31, lines 7-13].

Regarding claim 25, Ehling et al teach an analog to digital (A/D) converter 785 having an input coupled to the analog output of the DAA for providing a digital output [Fig. 18].

5. Claims 10, 12 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ehlig et al and Davis et al as applied to claims 1-7 above , and further, in view of Yurgelites [US 5,500,895].

Regarding claim 10, Ehlig et al teach a generic DAA; it does not disclose expressly an isolation element, such as capacitor of the DAA.

Art Unit: 2644

Yurgelites discloses analog communications using a DAA 22 having a capacitive isolation barrier using capacitors as shown in Fig. 2 [Figs. 1-3; col. 1, line 59 to col. 2, line 24; col. 3, lines 12-67].

Ehlig et al, Davis et al and Yurgelites are analogous art because they are from a similar problem solving area, viz. , telephonic communications across a DAA.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the isolation element of the DAA of Yurgelites with Ehlig et al.

The suggestion/motivation for doing so would have been to provide an explicit description of the DAA for its operational use with the Ehlig et al system.

Regarding claim 12, Yurgelites teaches the analog communication technique that significantly reduces common mode noise [col. 4, lines 47-58].

Regarding claim 19, the combination of Ehlig et al and Davis et al teaches an isolation system [Ehlig et al; Figs. 10, 12, 18] in which the input analog signal is a constant average signal to the isolation system [Davis et al; Fig. 9; col. 18, lines 53-59].

Claim 20 is essentially similar to claim 19 and is rejected for the reasons stated above apropos of claim 19.



Art Unit: 2644

6. Claims 8-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ehlig et al and Davis et al as applied to claims 1-7 above, and further, in view of either Scott et al [US 6,587,560 B1] or Rahamim et al [US 6,081,586].

Regarding claims 8-9 and 11, Ehlig et al teach a generic DAA; it does not disclose expressly an isolation element, such as capacitor or a transformer of the DAA and a termination resistance. However, these elements for a DAA are well known in the art of both analog and digital communications across an isolation barrier.

Scott et al discloses analog communications across a DAA having isolation barriers with capacitors and transformers [col. 2, line 15 to col. 3, line 8].

Ehlig et al, Davis et al and Scott et al are analogous art because they are from a similar problem solving area, viz. , telephonic communications across a DAA.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the isolation element of the DAA of Scott et al with the combination of Ehlig et al and Davis et al.

Art Unit: 2644

The suggestion/motivation for doing so would have been to provide an explicit description of the DAA for its operational use with the Ehlig et al system.

Regarding claims 8-9 and 11, the combination of Ehlig et al, Davis et al and Rahamim et al discloses a DAA having isolation barriers with capacitors and transformers [Rahamim et al; Figs. 3B-3E]; and teach terminating resistances 412, 413 and 430, 426 across the isolation barrier [Rahamim et al; Fig. 5].

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ehlig et al and Davis et al as applied to claims 1-7 above, and further in view of Chea, Jr. [US 4,387,273].

Regarding claim 12, the combination of the combination of Ehlig et al and Davis et al does not teach expressly a common mode interference signal sensing circuit and a summing circuit to remove the common mode interference signal.

Chea, Jr. teaches a common mode interference signal sensing circuit and a summing circuit to remove the common mode interference signal [col. 2, lines 64-67; col. 3, lines 1-3; col. 6, lines 36-54; col. 1, lines 55-67].

Ehlig et al and Chea, Jr. are analogous art because they are from a similar problem solving area, viz. , telephonic communications.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the common mode rejection technique of Chea with the combined system Ehlig et al.

The suggestion/motivation for doing so would have been to reduce the power dissipation in the interface circuitry of the isolation barrier [ Chea, Jr. ; col. 1, lines 7-12].

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramnandan Singh whose telephone number is (703)308-6270. The examiner can normally be reached on M-F(8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester Isen can be reached on (703)-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2644

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ramnandan Singh  
Examiner  
Art Unit 2644

A handwritten signature in black ink, appearing to read 'RNS', is positioned to the right of the printed name and title.